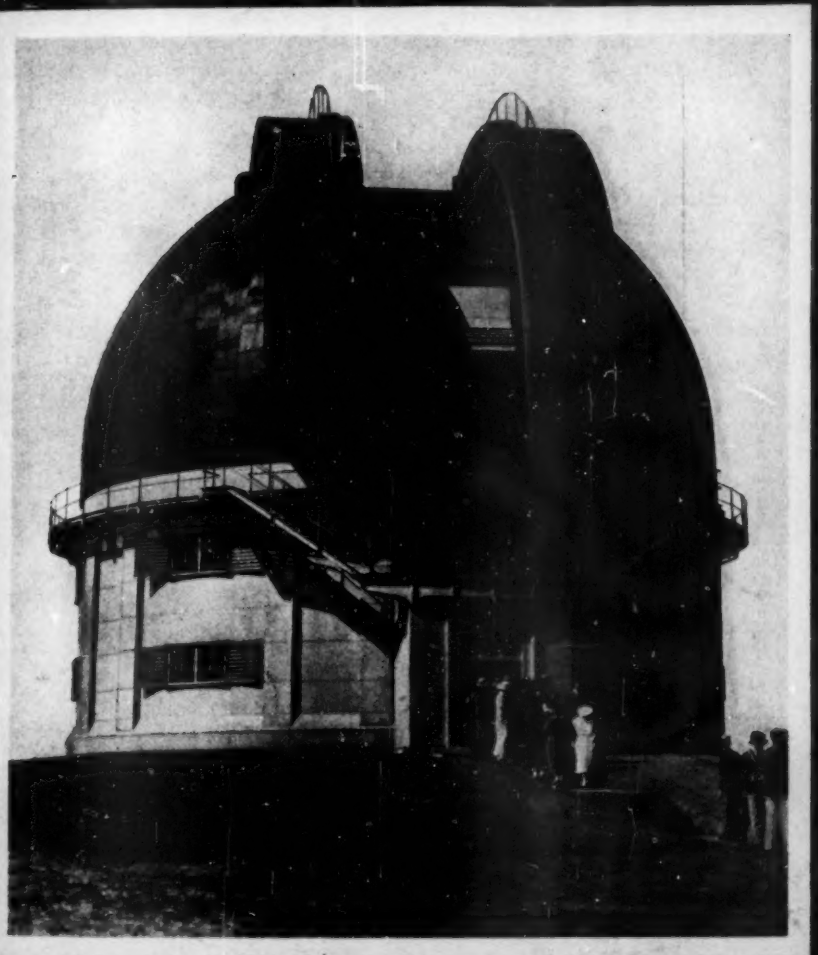
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



JUNE 15, 1935

Second In the World

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The Weekly Summary of Current Science

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DO YOU KNOW?

About 40 per cent. of medical graduates in this country become specialists within five years after graduation.

Pacific coast salmon packers hold a "salmon clinic" each year, at which time they spend an entire day discussing the state of health of their industry.

The possibility of traveling to the moon by means of "a flying chariot" was discussed by a scientific-minded Bishop in England in the seventeenth century.

A new departure in paper manufacture will be tried in Durban, South Africa, by a factory making wrapping and writing paper from the cane refuse from sugar mills.

Home owners only waste money if they try to cover old paint with new paint that is chemically incompatible, or in which there are pigments that do not go well with the old pigments, says the U. S. Forest Products Laboratory.

Preferences of insects for certain colors and intensities of light are being studied, in order to trap pests more effectively.

"A big book is a big nuisance," wrote a librarian of Alexandria, Egypt, who lived when books were rolls sometimes over 100 feet long.

Combined with other fruits, the fruit of some varieties of flowering quince is useful in jelly for high content of pectin and absence of starch.

Chlorinated rubber, a new raw material for use in the paint and varnish industry, has passed the experimental stage, and is being produced in Germany.

Meteorites which bombard the earth are the only astronomical bodies, other than the earth itself, of which we have factual knowledge, explains Dr. F. C. Leonard University of California astronomer.

WITH THE SCIENCES THIS WEEK

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RADIO

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ZOOLOGY

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Why do scientists value apes raised in captivity? p. 379.

RADIO

New Radio "Mirror," 35 Miles Above Earth, Found in India

Ionized Region Much Lower Than Previously Known Layers May Cause The Fading of Broadcast Signals

A NEW layer of ionized air molecules which may strongly absorb radio waves in the ordinary broadcasting region has been found at a height of thirty-five miles above the earth's surface.

Known as the "D" layer, the zone is some fifteen miles above the top of the much-discussed stratosphere. Yet it is only a little over half as high as any previously recognized radio zone such as the "E" layer at 60 miles altitude. Other radio layers are the F_1 region at 110 miles altitude and the F_2 layer at 145 miles height.

First suggested by Profs. E. V. Appleton and J. A. Radcliffe, British scientists, in 1930, the "D" layer has just been found in experiments performed by the Indian scientist, Mitra P. Syam, of the Wireless Laboratory, University College of Science at Calcutta. (*Nature*, June 7)

Chief characteristic of the new "D" layer is its property of strongly absorbing long radio waves and its permitting penetration by waves below a definite wavelength.

Reflection of radio waves off the "D" layer appears to be a rare happening, Mr. Syam reports, which occurs only when its ordinarily diffuse boundary becomes sharp.

In reply to inquiries about the "D" layer, radio experts of the National Bureau of Standards said the discovery was of wide interest because of the possibility that it may explain the occasionally poor transmission of ordinary broadcasting waves during the day time.

For no known reason radio waves in broadcasting range seem sometimes just to disappear. While yet unaware of the details of the report by Mitra Syam to *Nature* the government scientists suggested tentatively that the strong absorbing power of the "D" layer for long waves might account for this known disappearance.

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ZOOLOGY

Baby Chimpanzee Is First Born To Captive-Born Mother

ANNOUNCEMENT: Mr. Bokar and Mrs. Cuba Chimpanzee announce the birth of a baby son, Peter, on April 11, 1935. Weight: four pounds. The mother was formerly known as the daughter of Jim and Mona of Havana, Cuba.

Such an announcement, but worded very differently, appears in the dignified print of the scientific journal *Science* (June 1). It is of great interest to scientists because young Peter is the first known offspring of an ape born in captivity. He is the first "tame" grandchild.

Cuba, the mother, is the first of the man-like animals for whom a complete scientific record is available of her birth, the age at which she became an adult, and her treatment of her infant son.

This birth at the Yale Anthropoid Experiment Station, Orange Park, Fla., marks a mile-stone in the building up of a colony of animals whose whole history is known to science, and who will provide standardized laboratory material for the scientists who wish to use them for biological or psychological research. It is the hope of the station's director, Dr. Robert M. Yerkes, who makes the announcement, that within a few years every animal in the colony will have a complete record available of birth date, ancestry, and developmental history.

Chimpanzees mature somewhat earlier than man, Cuba has demonstrated. She became physically an adult when she was just over seven years old, in April, 1933. The next month she was given her mate, Bokar, a young male believed to be about eight years old. By August, 1934, when she was just eight years, five months old, Cuba was expecting her son. Peter was born on April 11, 1935, eight calendar months later, a full-term healthy infant who had a before-birth lifetime just about one month shorter than that of man.

FIRST "TAME" GRANDCHILD

Peter, one-month-old chimpanzee, is here shown as he was photographed by Dr. Robert M. Yerkes, of the Yale Laboratories of Psychobiology. His birth and survival are of great importance to scientists because he is the first known offspring of an ape who was herself born in captivity.

Cuba is not a good mother. She held her baby awkwardly, usually grabbed in one hand. She would not allow him to cling to her as baby apes do in the wild. She would not nurse him. Instead she treated him much as she might any strange object which interested, puzzled and annoyed her.

Overnight the scientists allowed Cuba to keep the baby, watching them from time to time until morning came. Then they took him away from her so that he might not be killed by her neglect or abuse. She did not seem disturbed by the separation.

And Peter got along very nicely without his mother. He was fed a diet such as any human infant might enjoy. Evaporated milk, irradiated with the sunshine vitamin, corn syrup, water and lemon juice. He took it readily enough from the bottle and throve from the first.

Although the parentage of Peter's mother is certified to by scientific records, his father's ancestry is unknown. Bokar's birth was not witnessed. He was brought from French Guinea to the Yale station in 1930 by Dr. Henry W. Nissen, and it was then estimated that he must have been born about 1925.

Cuba, her mother Mona and her fath-

er Jim, were for many years members of the Abreu primate collection in Havana, and were presented to the Yale station in 1931 by Pierre Abreu. Jim, however, then about 31 years old and considered unsuitable for breeding, was given to the Philadelphia Zoological Garden.

Of Peter's birth, Dr. Yerkes says that it is the prologue to a story which it will require decades to complete, whose plot features the breeding and other shaping of chimpanzees to specification and the animal's standardization for use as material for research.

"Instead of keeping the animal as it comes from the wild, we purpose to fashion it to maximal usefulness as an experimental object," Dr. Yerkes said.

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PHYSICS

New "Yardstick" Suggested To Check Earth's Motion

Prof. Compton Reports Daily Variation in Cosmic Radiation Is As Expected From 669,600 M.P.H. Speed

THE "strong" possibility that science has a new yardstick with which to measure the earth's motion relative to the rest of the universe was conservatively announced by Prof. Arthur H. Compton, Nobel Prize winning scientist. (*Physical Review*, June 1)

The yardstick is the difference in intensity of cosmic radiation which should result from the earth's motion through space, providing cosmic rays originate outside the galaxy of which the earth, sun and the myriad of visible stars are a part.

Reporting in a paper prepared jointly with Dr. Ivan A. Getting of England's Oxford University, Prof. Compton states that existing cosmic ray intensity measurements show a daily variation of just the anticipated type. Prof. Compton, University of Chicago professor, has been visiting professor at Oxford University during the academic year now ending.

Best checks on the earth's motion through space indicate it is rushing along, like a speck of paint on the spoke of some giant wheel, with a speed of 186 miles a second, or 669,600 miles an hour.

Because of this enormous speed, calculation shows that cosmic ray intensity on an unmagnetized earth at sea level ought to be a little over one per cent. greater on the earth's front side than on the back.

Actually the earth is magnetized and by taking this into account it is computed that the daily variation of cosmic ray intensity ought to be only one tenth of one per cent.

Moreover, the maximum effect ought to appear every twenty hours and forty minutes based on star (sidereal) time.

Already, Dr. Compton reports, measurements by Prof. Hess in Germany over a period of a year suggest agreement with calculated cosmic ray intensity curves.

"Though existing data are not of sufficient precision to show the difference," Dr. Compton says, "the predicted effect is of sufficient size to be measurable with some precision by using the more refined meters now in use.

"While we must wait for such measurements before we can consider the effect due to the rotation of the earth's galaxy as established, the agreement with the predictions . . . . gives strong presumption in its favor.

"Its existence (the daily variation of cosmic ray intensity) would imply that an important part of the cosmic rays originates outside of our galaxy. If its magnitude is found to be as great as we have predicted, it will imply that practically all the cosmic radiation has an extra-galactic origin."

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Soviet scientists are preparing an atlas of world agriculture.

GEOGRAPHY

Geographer Protests Chaos Of Old and New Names

THE BUSINESS of re-naming countries and cities of the world is becoming so confusing to many persons, that one professor of geography is moved to protest the present chaos.

News readers and geography students have dutifully learned to recognize the cities that prefer to be called Oslo, Istanbul, Peiping, and Marseille, rather than the old, familiar names Christiania, Constantinople, Peking, and Marseilles.

But Warszawa, s'Gravenhage, Firenze, and Praha are harder. And why? Simply because some of the very editors and authors who have shifted to new names for some places shy away from others, and continue to write of Warsaw, the Hague, Florence and Prague.

Protest, and several practical suggestions, are offered by Prof. Eugene Van Cleef of Ohio State University. (*Science*, May 17).

Pointing out that students are handed text books, atlases, and other reference works which show no accord regarding foreign names, Prof. Van Cleef continues:

"One large commercial atlas shows no old names. Naturally students are bewildered and ask which one of these is correct. They may sit in courses offered by several different instructors, among whom there is no agreement as to the proper form, thus giving rise to further confusion."

Aside from the Soviet Union, which has introduced many names actually new, the "new" names are mostly not new at all, Prof. Van Cleef points out. Post-war nationalism has resurrected a good many of these old-new names. In addition, natives of some countries have begun to request international use of the country's name, without translation.

Decisions Not Known

The U. S. Geographic Board and a British committee have passed upon spellings of foreign place names. But, says Prof. Van Cleef:

"Their deeds are relatively little known among the mass of people, including great numbers of teachers. It is one thing to make these decisions, but quite another to disseminate them."

He suggests, as a remedy, repeated publicity in the public press, to be sought by these organizations regarding their conclusions. All map publishers might also be enlisted to work with them, to the end of establishing common usage of a single form for "each political or natural geographic phenomenon of the earth."

This geographer further suggests that, until the new names become commonplace, they should be written with the old name following in parenthesis. Chicago tried this system, when it changed the house-numbering system, and despite fears that the two numbers—the old one in parenthesis—would be confusing, the double system did the work.

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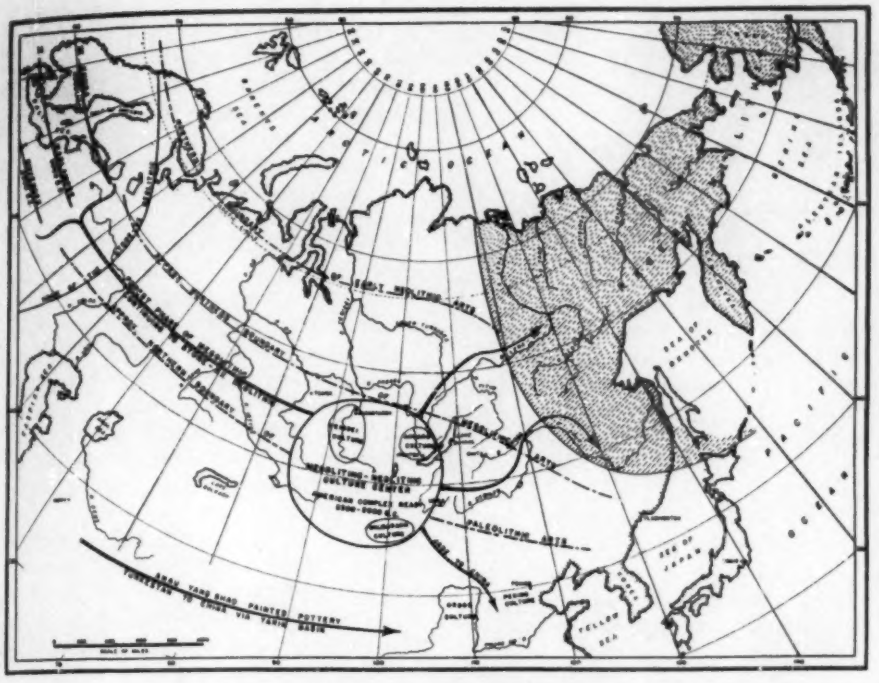

FRONTIERS OF MAN'S WANDERINGS

In this map Dr. Spinden marks the northern frontiers beyond which ancient man apparently did not spread during different stages of his cultural development. Men in the Old Stone Age never got within 3,000 miles of Bering Strait, and America was discovered so late that it is a strictly modern world, this archaeologist contends.

ARCHAEOLOGY

Was America Discovered Only About 4,000 Years Ago?

"Deflated" View of New World's Past is Spinden's; He Says Earlier Man Was Too Far South for Crossing

THE DISCOVERY of America by man took place no longer ago than about 2000 B.C., and the human beings who first trod American ground were modern men. America had no ancient 20,000-year men, as some scientific estimates have assumed.

This "deflated" view of America's history is reached by Dr. Herbert J. Spinden of the Brooklyn Museum, who is endeavoring to fit into the stream of world history the early Americans—Folsom hunters, Eskimos, Mayas, and other aborigines.

Dr. Spinden stated in an interview that he sees a need to veer away from the "inflation" theories which tend to picture a longer and longer past for the New World. By some of these theories the presence of mammoth hunters in America is interpreted to mean primitive Ice Age inhabitants, some 15,000 or 20,000 years old.

Certain of the large mammals now extinct are generally believed to have survived the Ice Age in America, he pointed out. And if they did, they may have survived it by many thousands of years, well down toward the Christian era. This very thing happened in the case of the European aurochs.

Men from the Old Stone Age never reached America, the archaeologist reasons, because those primitive wandering cave men did not spread so far north as Siberia—the gateway of American discovery. On an archaeological map he showed that Old Stone Age discoveries have not been made farther north than the British Isles and the Gobi Desert.

Hence, Europe's dawn men, Neanderthal men, and other Old Stone Age types failed to get within 3,000 miles of the East Cape of Siberia, it appears. And the East Cape, up near the Arctic Circle, was the approximate place where the short voyage of American discovery was supposedly made.

The Ice Age, spreading its chilly glaciers down over the northern part of the earth, kept Old Stone Age man from moving north, Dr. Spinden explained. Not until the ice sheets melted back, and forests grew again, did man wander toward the Arctic Circle. That was when the Mesolithic, or Middle Stone Age was ending and the Neolithic, or New Stone Age was coming in. And that, Dr. Spinden reasons, was the time of America's discovery.

Stone implements and other enduring relics found on both sides of the world are cited by the archaeologist in support of this explanation. The harpoons and arrows and other implements of Neolithic hunters at Lake Baikal, in Siberia, match with similar things made by prehistoric Indians in America. The New Stone Age cemeteries of Lake Baikal are dated at about 2000 or 2500 B.C.

America evolved her aboriginal civilizations all within a few thousand years by this theory. The waves of immigrants from Asia brought some fundamental gifts of art and craft knowledge, and the groups spread to far corners of the New World, developing quickly such great civilizations as the Mayas, Aztecs, Incas and Mound Builders displayed in favorable centers for culture.

"The New Stone Age," said Dr. Spinden, "lasted well up into the secondary and sophisticated age of the Mexican Toltecs, as is shown by richly furnished tombs with stone axes, flint implements, and highly developed pottery, but not a trace of metal."

A royal grave found at Teotihuacan, Mexico, and belonging to about 1100 A.D. is one striking bit of evidence showing the Neolithic foundation on which the great Toltec Indian civilization depended almost throughout its existence. In this royal grave archaeologists found stone blades similar to stonework made by comparatively simply cultured people of Europe. Yet the Toltecs were advanced in civilization, and after conquering parts of Yucatan in the twelfth century they rapidly gained knowledge of writing, astronomy, arts and industries.

Nowhere in the world, Dr. Spinden stated, do cultures continue for thousands of years without change; and the stone tools and weapons which featured America's civilizations throughout are evidence that these civilizations are not very old.

GEOGRAPHY

Historic Maps of Interior China Now Gift to Library

Surveying Documents Outlining Topography Of 2,800 Square Miles Were First Ever Made There By Whites

WHITE men's first maps of interior China, made under military guard years ago while the smoke of the Boxer Rebellion still hung in the oriental sky, have just been turned over to the Library of Congress by R. H. Sargent, veteran topographic engineer of the U. S. Geological Survey.

For thirty-two years Mr. Sargent has treasured these maps while he journeyed all over the Americas surveying and mapping. Now, as he leaves Washington for his 27th trip to Alaska, his original plane table maps of China go to the national library for safe keeping.

Stocky, with tanned cheeks and a thatch of snow-white hair, Mr. Sargent's eyes twinkled as he went over the maps he has treasured so long.

"Bailey Willis, Eliot Blackwelder and I got into China just after the Boxer uprising had been quelled," Mr. Sargent said. "The Carnegie Institution asked us to make a geological and topographic study of the mountain country west of Peiping near the Great Wall."

Bailey Willis is the nationally known geologist now emeritus professor of that science at Stanford University. Dr. Blackwelder is the present professor of geology in the same school.

The expedition entered China in propitious circumstances. Official China, at least, was very, very well behaved just after the Boxer episode. From Tientsin to Peiping travel was by train. And then a hundred miles westward the three Americans came to the railhead.

Military Protection

Out came instruments and the party went to work. And work they did, fast and furiously, under protection of a military escort to keep off Chinese bands who still didn't know the Boxer affair was over.

The first bench mark, Mr. Sargent recalled after a look at his time-worn maps, was at 42 feet above sea level. That was on January 2, 1903. Fifty-eight days and 200 miles later their survey showed an altitude of 10,000 feet. In only 21 working days they had obtained observations on enough peaks, crests, ridges and valleys to map, for the first time accurately, some 2,800 square miles of territory! Perhaps that's not much as judged by present-day aerial mapping, but in 1903 walking was the mode of transportation in China.

What Willis, Blackwelder and Sargent accomplished in three weeks' working time is comparable to the normal mapping progress of decades of time and generations of men in better known countries.

Finally at 10,000 feet they reached Wu-tai-shan, then the largest Buddhist center in northeastern China. Its 28 statues to Buddha stared mystically down on them.

Slept in Temples

"We slept in temples that night," Mr. Sargent recalled.

"Didn't you have trouble with the natives, Mr. Sargent?"

"No. we didn't. The word passed ahead of us from town to town that white men were coming. At Wu-tai-shan only seven white men had visited there before. At the more remote places we were the first.

"Because news of our coming preceded us, what corresponds to the town's mayor greeted us at each place. If we didn't sleep in his house the town's temple was at our disposal. And while we slept a runner raced ahead to prepare for our arrival at the town where we would stop the next night, some ten or twenty miles away. The Chinese, you know, don't live in scattered houses. They like their towns.

"At each settlement I would seek out the oldest, and supposedly the wisest graybeard and have him tell me the name of the place. I would write it down phonetically, as it sounded to me, and have him write down the Chinese characters for it. When we came back to America Chinese students in our universities took my spelling, and the Chinese characters, and figured out where we stopped.

"From the mountain country we took a cross country jump some 225 miles. As far as the Hwang Ho (Yellow River) we traveled in the Chinese two-wheeled carts. My principal recollection of that stage of the journey was the absence of springs in the carts.

"Then, crossing the Hwang Ho we kept on to the Hwan River farther west. On this stretch the trails were so narrow that even the burros had difficulty.

"Finally reaching the Hwan we floated down stream for a hundred miles on boats, taking time traverse measurements of the distance covered.

"That stage of the journey was comparatively easy but we had yet to reach the Yangtze River, another hundred miles to the south. The only way to get there was on foot. And we walked all the way taking stadia traverse measurements en route.

"How do you take stadia measurements? Well your surveying telescope has two spiderweb threads inside it spaced closely together. As you look through the instrument the tiny space between them will cover larger and larger objects as you move away. At one hundred yards a small tree may just be enclosed in the field of view. At two miles the whole side of a house may cover the same angle.

"To take stadia measurements your aide goes ahead with his surveying rod and holds it up while you see how much of it is enclosed between the cross hairs inside the instrument. Then by similar triangles you can calculate how far away the rod is. Finally you pick up your surveying telescope, move ahead of the rod and sight back at it. Thus the party works its way across country as we did.

"The rest of the trip? Well, there's not much left to tell. We hit the Yangtze river at the head of steamer navigation some 1,100 miles inland from Shanghai and caught the next boat."

The geological and topographical results of the expedition have been published in two volumes by the Carnegie Institution of Washington under the title "Research in China." Much of the material is still the best known on the region today.

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MEDICINE

Egyptian Drug Addicts Now In Grip of Tea Addiction

DRUG addicts in Egypt have turned to tea. They are spending almost all their wages on tea and cannot work without it. Their health and physique are breaking, and a village headman reports that where formerly four men hoed an acre it now takes eight.

Strong tea dust is boiled and reboiled, and the resulting beverage is taking the place of the morphine and cannabis formerly consumed by many laborers, reports the London correspondent of the Journal of the American Medical Association, who gives as his authority Russell Pasha, chief of police of Cairo. (*Journal American Medical Association*, June 8).

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PHYSICS

Einstein's Equivalence Law Is Again Proved Correct

Cornell University Scientist Using Theoretical Method Reaches Same Conclusion as Did Aston

NEW PROOFS of Einstein's law that mass and energy are the same thing in different forms has been evolved by Prof. H. A. Bethe, of the Cornell University department of physics.

The Cornell work removes an obstacle from one of the most important advances now under way in science, the investigation of the atomic nucleus. In the disintegration of the lightest elements, such as deuterium and lithium, the loss of mass was offset by an equivalent amount of energy, thus confirming Einstein's law.

Apparent contradiction to this law had arisen when investigators disintegrated heavier nuclei, such as beryllium and boron. Not enough energy seemed to be given off when these elements were disintegrated. This cast doubt on the validity of the Einstein formula and caused consternation in this field.

Starting from the point that most nuclei disintegrate into helium, Dr. Bethe suggested that the mass of the helium nucleus was greater than previous measurements had indicated.

He was able to compute the atomic weights of all light elements to a greater accuracy than any previous method in chemistry or physics had given. With these more accurate masses Einstein's law was found to hold for every nuclear disintegration thus far investigated.

By a coincidence an independent investigation, conducted by Dr. F. W. Aston, well-known British physicist, confirmed by direct measurement the most important of the new atomic weights which Dr. Bethe had arrived at by the theoretical method. With confidence again restored in the validity of Einstein's law of the equivalence of mass and energy, the path is now open for probing the remaining secrets of the structure of matter which are bound up in the invisible nucleus of the atom.

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QUINTUPLET "LOCH MONSTER"
Fossil bones of great creature found on the Japanese-owned end of the Island Sakhalin.

PALEONTOLOGY

Quintuplet "Loch Monsters" Fossils Found on Sakhalin

QUINTUPLETS in the "Loch Monster" field feature the newest reports from the Japanese-owned end of the Island of Sakhalin, just off the coast of mainland Asia. To be sure, they are all dead—have been for something like thirty million years. They are only fossils. But quintuplets!

The find, made by Dr. Ko Nagao, Japanese paleontologist, is rated as one of the most notable fossil discoveries of recent times, because the creatures represented by Dr. Nagao's five perfect skeletons had been known hitherto only as fragmentary remains.

They appear to have been animals more or less like sea-cows, but with flipper-like limbs aft as well as forward, perhaps permitting them to get about to some extent on land—therefore true amphibian "dragons." They are known to scientists as *Desmostylus japonicus*.

Dr. Nagao is a professor of geology in the Imperial University of Hokkaido, Japan's northern island. He gained distinction several years ago through his discovery of a fossil of an ancient, dragon-like monster, known as *Dracodon*.

Not much has been known about *Desmostylus*. The skull of one was unearthed in Mino Province, Japan, back in 1898; then, in 1907, another skull was discovered in the United States.

It began to look as if these would be the only *Desmostylus* fossils to be discovered. So with this meager material geologists set about conjecturing the creature's appearance and habits. They came to the conclusion that it must have been an herbivorous mammal, with the sea for its home, and similar, perhaps, to the manatee, or sea-cow.

In May, 1932, someone brought another head-fossil of *Desmostylus* to the University. This led Dr. Nagao, in the summer of the same year, to begin his search for a perfect and whole specimen. Up the River Kami, up its tributary the River Keton, he searched; finally his zeal was crowned with success.

His discovery is considered particularly valuable, because the excellent condition of these new fossils will enable scientists to make more accurate deductions as to the habits of these animals.

Dr. Nagao's conclusions differ from those previously accepted. It can not be like the manatee or sea-cow, which has flippers in place of fore-feet and only rudimentary signs of back feet; for in the case of *Desmostylus* the construction of the pelvic girdle indicates the creature had back flippers as well as front ones, and consequently was an amphibian.

From the rock strata in the neighborhood, Dr. Nagao is inclined to think that the *Desmostylus* became extinct in the middle of the Tertiary period.

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PHYSIOLOGY

Youngest Children Most Likely To Be Malformed

THE YOUNGER children of very large families are more likely to be born with some physical defect than are the first-born children, Dr. Douglas P. Murphy, of Philadelphia, told the meeting of the Eugenics Research Association in New York.

Death certificates of 130,132 persons dying in Philadelphia during a period of five years were examined by Dr. Murphy. Then, by visiting the mothers, he obtained information about the births of 582 individuals who had been born malformed in some way. Thirty-three of the families visited were found to contain more than one malformed child.

Malformations occurred among the oldest four in the family less often than might be expected upon the basis of chance alone. But the seventh-born children were defective twice as often as might be expected, and the ninth-born three times as often.

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SEISMOLOGY

Northern India Scene Of Many Earthquake Shocks

NORTHERN India, stricken by disastrous earthquake on Friday, May 31, is one of the "most seismic regions in the world," Frank Neumann, seismologist of the U. S. Coast and Geodetic Survey, told *Science Service*.

In prehistoric, possibly pre-human, times, the most tremendous earthquakes the world has ever known rocked the region, as is evidenced by geological structures still existing.

The mountains are still growing, so that shakes like the recent one are still to be expected fairly frequently. A violent earthquake there on Aug. 26, 1931, killed several hundred people. There was another sharp shock, though not fatal in its effects, on June 14, 1934.

The location of the epicenter of this earthquake was an unusually difficult matter, because of its remoteness from all of the reporting seismograph stations. However, the Jesuit Seismological Association, St. Louis, Mo., has calculated a tentative location in latitude 27.3 degrees north, longitude 65.7 degrees west. This is in the mountainous region of eastern Baluchistan, approximately 220 miles in a southeasterly direction from the ruined city of Quetta.

The data for this estimate were gathered telegraphically by *Science Service* from the Dominion Observatory, Ottawa; Canisius College, Buffalo, N. Y.; Georgetown University, Washington, D. C.; the University of Vermont, Burlington, Vt.; the University of Virginia, Charlottesville, Va.; Pennsylvania State College,; St. Louis University, St. Louis, Mo.; the Seismological Laboratory, Pasadena, Calif., and the stations of the U. S. Coast and Geodetic Survey at Honolulu, Chicago, and Tucson, Ariz.

Science News Letter, June 15, 1935

ANIMAL PSYCHOLOGY

Cow vs. Horse— Which Learns Best?

COWS are just as clever as horses. Bossy's timid and backward disposition keeps man from recognizing her mental ability.

Temperament differences and intelligence similarities between these two favored domestic animals have just been revealed by tests at Cornell University, by Dr. L. Pearl Gardner as part of a series of experiments on the nature of learning in man and animals.

Cows not only learn as easily as horses, but remember better what they have learned, it was discovered. Among the six breeds of cows used in the tests, the best "milker" was also the best learner.

The learning problem for the cows and horses was to find breakfast when it was hidden in one of a row of three boxes under a black cloth. Altogether 41 cows were tested with 850 trials and 62 horses with 1,234 trials.

The cows were timid and fearful. Many were so afraid that they preferred to go breakfastless rather than attack the strange thing.

Yet when the scores were all in, it was found that both horses and cows had the same average of seven boxes opened before the correct one in 22 trials. Cows made mistakes in method of attack less frequently than horses, who often nudged the box that was already open.

Ten of the cows that had learned the problem were re-tested after a year during which they had had a vacation from the experimenting. Their retention for a year was much better than that of horses over a period of three to eight months, it was found.

Science News Letter, June 15, 1935

IN SCIE

ARCHAEOLOGY

World's Oddest Shoe On Display at Chicago Museum

MAGIC boots in which the fairy tale hero walked safely invisible are not so wonderful, after all. At least, Australian bushmen would think nothing of it, for they used to wear shoes themselves that left no plain track that an enemy could follow.

Calling these bushman shoes "the oddest shoes in the world," the Museum of Science and Industry, Chicago, is exhibiting one of them. The bushmen no longer make them, and they are extremely rare.

The shoe is woven of hair rope in which feathers of the emu are enmeshed. The wearer of these shoes was assumed to have supernatural powers. The shoes had further practical usefulness in protecting the wearer against hot sands and sharp stones of the Australian bush.

The feather shoe is a feature of a collection of over 300 historic and modern shoes, many worn by famous people, and now temporarily at the museum.

Science News Letter, June 15, 1935

ZOOLOGY

Hippos Can't Stay Under Water So Long As Whales

BEHEMOTH is no match for Leviathan, when it comes to holding his breath under water.

Prof. G. H. Parker, Harvard University zoologist, held a watch on three different hippopotamuses, in the zoological gardens at Hamburg, Germany, Philadelphia, and Washington, D. C., respectively, as the huge creatures, immersed in their tanks, came bubbling up at intervals to breathe. He found that the longest time any of them stayed under was 4 minutes 40 seconds, the shortest time 5 seconds, and the average 2 minutes 14 seconds. (*Journal of Mammalogy*, May).

This, he comments, does not come anywhere near the long breath-holding performances of submerged whales, which are truly aquatic mammals. The hippo is to be classified as an amphibious rather than an aquatic animal.

Science News Letter, June 15, 1935

FIELDS

MEDICINE

Physicians Warn Against Reducing By Dinitrophenol

FAT folks can take off weight by proper reducing diets more effectively than they can by using the drug dinitrophenol.

The use of this drug with the long name and dangerous reputation has spread like wildfire among the obese of the nation within the last two years. Six months ago, the Journal of the American Medical Association issued a warning against reducing through the use of this substance, which can be obtained at any corner drug store.

Now come two Pittsburgh physicians, Drs. James M. Strang and Frank A. Evans, not only to repeat the warning, but emphatically to state that the drug has little practical value in weight reduction. (*Journal, American Medical Association,* June 1).

The tests showed that the same rate of weight loss can be achieved by only very slight modifications of the diet. In fact, they found the rate of weight loss obtainable by the use of the drug is only from one-fifth to one-sixth of the rate that is obtainable by diet alone.

Science News Letter, June 15, 1935

MUSEUM SCIENCE

It Isn't Taxidermy Now—It's Sculptodermy

THE GENTLE art of arranging animal skins in a lifelike manner isn't taxidermy. Not any more.

Sculptodermy is a more fitting term for zoological art in its up-to-date forms.

So the American Association of Museums was told at its meeting in Washington, by Louis Jonas of Yonkers, N. Y. Mr. Jonas has watched animal exhibits evolve from the stuffed owl era to the present humanized scenes that show birds and beasts so natural that visitors hardly know whether they are in a museum or a zoo.

Where the taxidermist used a variety of stuffings to fill out a skin, the sculptodermist models the contours of the animal for his foundation. Sometimes, he does not even use a real skin at all, an idea that would have horrified the old-school taxidermists. "Nature faking," they used to say disapprovingly, when even a few artificial leaves were put on the ground for a stuffed bird to stand on. Now, a whole undersea group of sharks, seaturtles, and fish struggling for existence may be made up and none of it "real."

"Is it faking?" asked Mr. Jonas. "No; truthful ideas are reported and scientific knowledge interpreted."

To show how far zoological art has come in its evolution, Mr. Jonas told an old incident of a naturalist who found a taxidermist struggling with a grotesque form wrapped in excelsior. He asked whether it was a lion or a lamb, and the proprietor answered:

"I don't know yet. I have the skins of both animals. Whichever will fit best, I'll use."

Today the three-dimensional scenes of animal life in museums are so real, Mr. Jonas said, that sculptors, painters and designers come to study them for models and reference.

Science News Letter, June 15, 1935

PLANT PHYSIOLOGY

Ethylene Made By Plants In Stems And Blossoms

ETHYLENE, used to speed up the production of color in fruits and vegetables, appears to be a normal product of the plants' own activities, from the results of recent researches at the Boyce Thompson Institute for Plant Research, Yonkers, N. Y.

Recently, independent investigations at the University of Minnesota and at Cambridge University showed that this gas is produced by apples in the process of ripening and by self-blanching celery. Now Drs. F. E. Denny and L. P. Miller of the Institute have shown that ethylene is also produced by such diverse things as dandelion, rhubarb and hollyhock leaves and peony tops. Six dandelion flowers in a two-gallon container produce enough ethylene to cause typical downbending reaction in potato leaves.

Ethylene has such a powerful effect on the growth-rate of potato leaf-stems that one part in 40 million of air causes a downward bending, due to speeding up of growth in the tissues of their upper sides, Dr. William Crocker, director of the Boyce Thompson Institute, has shown.

The researches of Drs. Denny and Miller are cited as further evidence for the harmlessness of using ethylene gas in preparing vegetables for the market.

Science News Letter, June 15, 1935

NUTRITION

Mayo Clinic Finds Apples Disagree With Many

AN APPLE a day deeps the doctor in pay.

Some such paraphrase of the old saying will need to be written as a result of studies by Drs. Walter C. Alvarez and H. Corwin Hinshaw, noted authorities on diet at the Mayo Clinic. Apples are among the foods that most commonly disagree with people, these physicians have found. (*Journal, American Medical Association,* June 8)

Four persons out of five in a group of 500 men and women who admitted food sensitiveness complained of discomfort after eating apples, onions, cabbage or milk. Many who cannot touch raw apples or onions can digest with comfort boiled onions or cooked apples. Others who dare not eat boiled cabbage are able to digest cole slaw or sauerkraut, the doctors found.

Other common offenders among foods are wheat, chocolate, milk, eggs, tomatoes and oranges.

If a person has indigestion, he can select from the following list of fairly innocuous foods, these physicians find: lamb, gelatin, butter, sugar, rice, rye, barley, arrowroot, tapioca, sago, Lima or soya or string beans, cooked apple, pineapple juice, beets, peas, asparagus, Irish and sweet potatoes, eggplant, turnips, parsnips, pumpkin, artichokes, cooked pears and weak tea.

Science News Letter, June 15, 1935

OCEANOGRAPHY

Plan New Ice Breaker For Northern Arctic Sea Route

EVER mindful of better ways to link European Russia with the far-flung provinces and cities like Vladivostok across Siberia, U.S.S.R. is completing plans for a new ice-breaker to convoy ships along the ice-bound northern sea route for 4,000 miles.

It is proposed to install engines capable of generating 24,000 horsepower in the new ice-breaker which will make it over twice as powerful as the famous S.S. Krassin, rated at 10,000 H. P.

With great fuel capacity the new vessel should be able to make the 4,000-mile trip in a single season without touching at intermediate ports for fuel. Further exploration of the Arctic ocean is projected and the vessel can conduct freight ships through the hazardous stretch of sea.

Science News Letter, June 15, 1935

GEOGRAPHY

Human Eagles Make Geography

Group of Young Flying Map Makers at Harvard Increase the Accuracy of Our Knowledge of the Earth

By DR. FRANK THONE

WHEN the younger grandfathers and the older fathers of the present generation of school kids were themselves kids in school, their first introduction to the mystery of maps, in geography class, was usually worded something like this:

"Now, children, just imagine yourselves able to fly, like eagles, until you were very high up above the earth, so that you could see a long way in every direction. You would see everything spread out flat beneath you, but everything would look very small. You would see not only this town that we live in, but many others besides, and rivers and lakes and hills and mountains. And if you made a drawing of the country, as you looked down on it from away up there, it would look like this . . . ."

You were doubtless a little dizzy from this flight of fancy by the teacher, but it fascinated you just the same. All of us have a hankering for heights, clambering up trees and adventuring on the ridgepoles of forbidden barns as children, just to see what we can see; going mountain climbing, or at least taking elevator rides to the top of the Empire State Building, in later years for exactly the same purpose. Of all legends and tales, those of wing-footed Mercury, wing-shouldered Daedalus, the flying carpet of the Arabian Nights,—all that told of rising high and seeing far without the weary labor of climbing, have always been our favorites.

Dream Came True

Just about a generation ago, the dream of all youth for ages suddenly became real. Only a few months after the splendid tragic failure of Langley came the shining success of the Wrights. Men could fly at last; men could mount high and see the earth laid out beneath them like a map. The wings of Icarus were no longer broken; whereas we had before been forced to view our world with the short sight of beetles, now we could use the eyes of eagles.

Men were not long in realizing what their first-grade teachers had gently imagined for them. Pictures from the air were so obviously useful, as well as interesting. And when a world war broke out, just a decade after the first successful airplane flights, the evolution of air photography and air mapping was intensely speeded up under the lash and spurs of military necessity. The mechanical eyes of our mechanical eagles quickly reached an amazing accuracy and speed of operation.

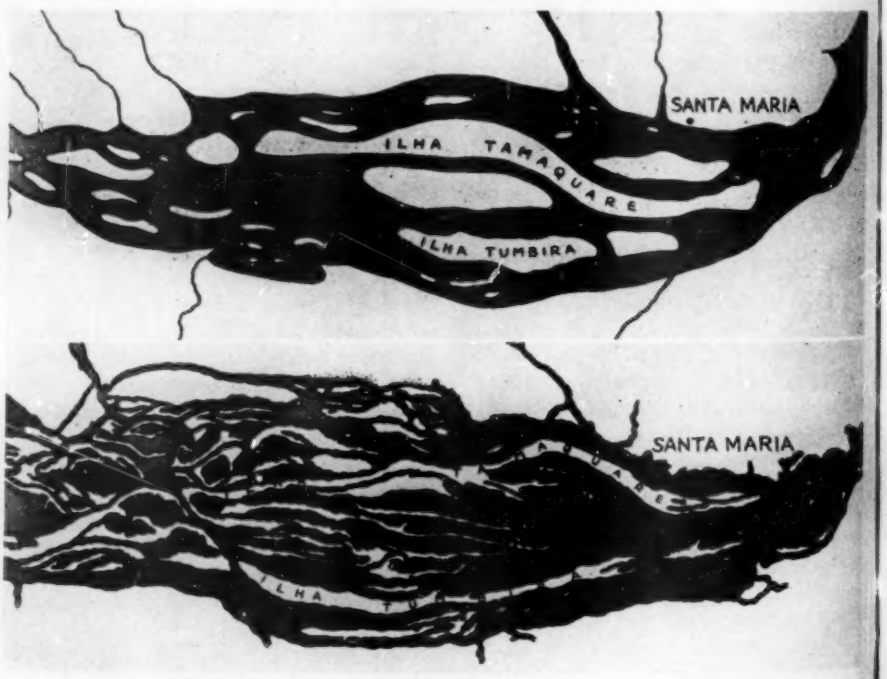
When the guns stopped—the blind guns for which they did the seeing—the eagles had no need to droop their wings. Unlike Othello, they did not find their occupation gone. On the contrary, in the service of peace and civilization, they had more occupation than ever. During the post-war years, airplane mapping has become one of the standard methods of geographers, map-makers, surveyors. The eagles' eyes make our daily lives safer and far more interesting than they used to be.

Lately there has been established at Harvard University a veritable nest of young human eagles, in training to fly forth into the skies over all the earth, to see and record and perfect our knowledge of the cities we dwell in, the ground whereon we walk, the seas on which we sail our ships. It is the Institute of Geographical Exploration, the dream-made-real of a young teacher of scientific geography, Weld Arnold.

Not that all the work of the young men of the Institute is done thrillingly on the wing. Not even eagles spend all their time among the clouds. Research students at the Institute have many exacting hours over the drawing-boards, many necessary nights with their books. Only the elect are admitted, and only those who can "take it" may stay. Many feel that they have been called, but only a few are chosen. And of these few, some are given wings to fly.

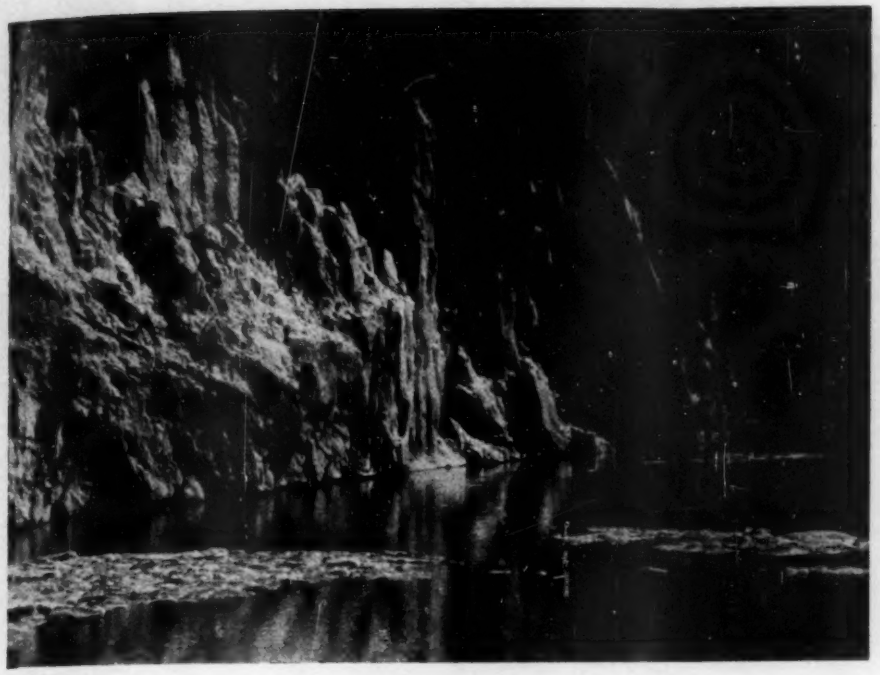
BEFORE

Made 20 years ago by conventional mapping methods, this chart of a Brazilian river is crude, incomplete and full of errors.



AFTER

A half-day's flight and camera shooting, with patient draftroom work afterwards, corrected twenty-year-old errors in the map of a tangled tropical river.



BEAUTY SURVEYED

Towering cliffs of solid ice, where Crillon Glacier, in Alaska, meets the sea. Note the two explorers "taking a chance" in an Indian canoe.

These fortunates, however, fly far and see much. The familiar skies of home, over Cambridge and Cape Cod, may see their first sky-circlings; but in the end their motors have roared to the echoes of the glacier-groaning mountains of Alaska, over "Ind's enameled peaks that rise around that inmost One," among the mysterious dead pueblos of our own Southwest, above the matted green tree-tops of the mightiest of equatorial river basins.

The skies of home are chosen first not merely as a matter of convenience or safety, but because the home city and the home state offer some mighty good training in the new geography. Boston and Cambridge present most interesting combinations of the old, tangled, "cow-path" streets dating back to earliest Colonial times, and the new, straight-line boulevards of modern motor traffic. The state of Massachusetts as a whole gives a wonderful range of topographic jobs to work on, from the flat shores of Cape Cod and the rocky coast of Nantucket to the mountainous lift of the Berkshire Hills.

Five Lenses

At Cambridge and Boston, and at Massachusetts, then, the map-making eagles first direct their high-altitude eyes. They are most remarkable eyes, those Fairchild cameras that are the tools of the map-making skyman. They look with five lenses at once, one straight down, and one to each of the four quarters of the compass. Each picture thus comes out in the shape of a Maltese cross, with an undistorted square in the middle, and on each of its four sides a rectangle wider at one end than at the other.

These flare-ended side pictures give plenty of drill at the plotting-board, for their distortions have to be herded back into straight-lined rectitude by proper mathematical formulae before they can be considered orthodox enough for really accurate mapping purposes. It is fascinating work, but exacting. Small wonder that Weld Arnold is proud of the record of his men, in making Massachusetts the first state in the Union to be completely mapped from the air.

Far Afield

Having won their right to wings over the home nest, the young eagles of geographic science are flying in many alien skies.

Worthy of eagles was their task on the Washburn Alaska expedition. Here they photographed the towering snow-wrapped mountains with their terrific precipices of sheer white and their awesome slow glacier-rivers of creeping ice. Those glaciers were their special quarry. They circled over them, charting their curving courses, getting details of their banded surfaces, marked with tell-tale rhythmic zones of annual growth, like the annual rings in a tree. In small boats they sailed impudently up to their towering faces where they front the sea—a most uneasy kind of adventure, since if one of them should suddenly "calve" an iceberg it would set up a miniature tidal wave able to swamp any lesser craft.

Eagle-worthy also was the task of the expedition that went around to the "back door of the Himalayas," through China's Far West, that inner land where few white men ever travel. This expedition's chief goal was Minya Konka, a tremendous mountain seen by an earlier American expedition and estimated by them to be higher even than Everest. The Harvard geographers worked from the ground as well as from the air, making careful sketches of geological and topographical features. They found Minya Konka to be lower than the earlier estimates had made it, and so second to Everest after all; but a most splendid, awe-inspiring peak none the less. And incidentally they had the privilege of gazing upon the Great Buddha of Kiating, Szechuan Province, a 200-foot image of the great religious leader carved out of a huge mountain crag long ago, as Washington's face is being carved on a peak in the Black Hills, in our own land, today.

Exploring Wilderness

While these two expeditions were searching remote mountain fastnesses for their secrets, a third was in a land without mountains but with rivers harder to master than any mountain. For the Rio Negro and the Rio Branco, tributaries of the vast Amazon, wind into labyrinthine channels in which a boat can get hopelessly lost, and the thick forest that covers the face of the land makes travel on foot simply impossible. The only means for rapid travel is the airplane, fitted with pontoons for use on the bayous and quieter backwaters, which constitute the only practicable landing fields.

Over this wide wilderness the plane again proved its value as a map-maker's eye-carrier. Maps made twenty years ago, by laborious parties in boats, showed four principal channels and perhaps a score of good-sized islands, on one particular stretch of the Rio Negro. These surveys required weeks of work in insect-infested jungles. And in a half-day's flight with a good plane and camera the whole tedious job was made obsolete; the river is now shown split into nearly a dozen channels by several times as many narrow, ribbon-strip islands, some of which curl and double on themselves like fish-hooks or carpenter's shavings. It is a simply astonishing demonstration of the tenfold

greater accuracy and the thousandfold greater ease of doing one's geography from the air.

But the making of modern maps by modern means is not the only occupation of the students of the Institute. They take their turn at making ancient maps by traditional means, quite as though they were artist-scribes in a medieval monastery. The eagles can play owl, on occasion.

Among the historical treasures of the Institute are several ancient books of geography, dating to pre-Columbian Europe. In these there are no maps, but cities and other places are set down in long lists, each spot given its latitude and longitude, sometimes with marginal notes on natural resources, commerce, or customs of the people. Graduate students have worked out maps from these, carefully drawing them in the antique style with quaint old-fashioned lettering. They have successfully recaptured the spirit of the old geographers, and are looking on the late-medieval world with late-medieval eyes.

Some of the marginal notes, transferred onto appropriate spaces of one of these maps in the original archaic Low German, are really amusing:

"Ibernia: In that land is Saint Patrick's hell or purgatory."

"Canaria: . . . is a rich island of wine."

"Norbegen: In that sea one finds the best stockfish."

"Sicilia: In that land there is a mountain that always burns and is called Aethna."

Egypt bears the alternative title, "the New Babylon, where the Insoldan or Great Emperor lives, who has possession of the Holy Sepulcher," and the Nile bears the name "Zenlus."

And off to the northwest of the British Isles is shown part of another island, labeled "Ciliven or Tileben," with the further information, "When the sun is in Cancer, the people have one month of day; and in Capricorn, one month of night."

There were diligent geographers in Germany in those days, but their diligence might have been better rewarded had they possessed better means of exercising it. The world had to wait long for its far-seeing eagles!

Science News Letter, June 15, 1935

A chain of old forgotten Spanish missions, swallowed by the desert a generation ago, has been found in California.

ASTRONOMY

Dunlap Observatory Dedicated On Director's 70th Birthday

See Front Cover

PAVING the way for new advances in astronomy's knowledge of the architecture of the universe, the David Dunlap Observatory was officially opened on Friday, May 31, the seventieth birthday of its director, Dr. C. A. Chant, whose lifetime has been spent in fostering Canadian astronomical development.

Presented to the University of Toronto by Mrs. Jessie Dunlap as a memorial to her late husband, an enthusiastic amateur astronomer, the observatory, located fifteen miles north of Toronto, contains the largest telescope in the British Empire and at the present time the second largest in the world. It is a reflector, with a seventy-four-inch concave mirror. The observatory is shown on the cover of this week's SCIENCE NEWS LETTER.

"We shall participate almost exclusively in work on stellar velocities and spectral photometry," Dr. Chant informed Science Service. "With a telescope of such power we shall be able to secure much valuable material, never before obtained.

"While the major part of the observational program, planned for years in advance, will be devoted to work on the motions, temperatures and densities of stars from spectroscopic observations, it is possible that a little time may be given to direct photographic work, especially in future years when we hope to secure additional instruments especially designed for that purpose."

In addition to the great telescope, with its seventy-four-inch disk of pyrex glass, the observatory has a nineteen-inch reflector designed and constructed by its associate director, Dr. R. K. Young. This instrument also will be used for spectroscopic work.

The observatory's location was decided upon after extensive investigation of all possible sites near Toronto. Situated on the highest point of land in the district, and north of the city so that smoke will be carried away by the prevailing northwesterly winds, at least one hundred clear nights are expected yearly, Dr. Young explained.

The site, formerly farm land, will be developed as an arboretum, to be known as David Dunlap Park. The tree plantings will be a great advantage from an astronomical point of view, since trees absorb much of the sun's heat by day, and thus minimize rising currents of air at night, which would otherwise create an unsteady atmosphere and interfere with the use of the telescope.

Sir Frank Dyson, former Astronomer Royal of Great Britain, Dr. Harlow Shapley, director of Harvard College Observatory, Dr. W. E. Harper, acting director of the Dominion Astrophysical Observatory at Victoria, B. C., and Dr. V. M. Slipher, director of the Lowell Observatory at Flagstaff, Arizona, received honorary degrees at a special convocation of the University, as did also Mrs. Dunlap and Dr. Chant.

Science News Letter, June 15, 1935

ARCHAEOLOGY

Single Hieroglyph Sheds Light On Ancient Toltecs

A SINGLE word sign on an old stone monument, detected by a young woman traveling near Pacific shores of southern Mexico, has revealed a new outpost to which the civilization attributed to "Toltec" Indians spread its ancient learning.

Miss Emma Reh, now in Washington, reports the discovery made at the ruins of La Labrada, in the Mexican state of Guerrero. Indians of the neighborhood called Miss Reh's attention to the existence of the ruins, the center of which was a tall, complex terrace, once stone-faced but now buried in forest.

Examining the carved monuments lying in underbrush around the terrace, Miss Reh quickly sketched about three feet of one twelve-foot monument. Later study of this drawing shows the significant "Glyph A," as Mexican scientists have called it, a picture sign found at ruined cities as far apart as Chichen Itza in Yucatan, Monte Alban in the southern highlands, Xochicalco in south-central Mexico, and now in the coast of the country. The ancient influence which spread common writing symbols over this wide area is often called "Toltec," a civilization preceding the Aztecs who were in power when Cortez conquered Mexico.

Science News Letter, June 15, 1935

HOW TO WILL YOUR EARS TO SCIENCE

Have this permit made out in triplicate and signed by each individual referred to in the body of the permit:

"We, the undersigned, sisters and brothers, (or, husband, sons, or daughters) of HERE GIVE FULL NAME OF PERSON CONCERNED, the only living members of his immediate family, understand that he wishes to promote the prevention and treatment of deafness by permitting the scientific study of his auditory mechanism. For this reason and to this end we hereby give our consent to the removal, at the earliest possible moment after his death, of the bones of his inner ears."

PHYSIOLOGY

Deafened Plan A Way To Will Their Ears To Science

A PLAN whereby deafened persons can will their ears to science was announced at Cincinnati by Dr. George E. Shambaugh, Jr., of Chicago, and Mrs. Katherine K. Madden of Washington, D. C., and was hailed as a solution of tremendous difficulties in the study of deafness.

Medical specialists, and many deafened persons themselves, listening with aid of hearing devices, heard Dr. Shambaugh describe the plan at the scientific session of the meeting of the American Federation of Organizations for the Hard of Hearing.

"The almost insurmountable difficulties in the way of obtaining pathological examination of the ears of hard of hearing persons," declared Dr. Shambaugh, "have been responsible, more than any other single cause, for our continued ignorance and helplessness against many cases of deafness."

Legal red tape has made it troublesome for deafened persons to come to the aid of science in this matter. Mrs. Madden reported a simple legal form which has been worked out, and which is intended to be signed in triplicate copies and deposited with the will of the individual, with the undertaking firm, and with the local committee or other organization set up by the local League for the Hard of Hearing. A local pathologist who will make necessary contacts for the autopsy should also be consulted, Mrs. Madden advised. The process is not disfiguring.

Nerve deafness and otosclerosis were cited by Dr. Shambaugh as conditions now imperfectly understood, mainly for want of information as to the diseased organs themselves.

"In our leading hospitals nowadays," he said, "the families of well over fifty per cent. of those who die consent to post-mortem examinations. Medical science, as a result, is liberally supplied with pathological material from most of the serious and fatal diseases and medical knowledge of most of those diseases is far ahead of our knowledge of deafness. For people do not die of deafness. And when they do die of some serious condition which brought them to a hospital, their deafness is lost sight of in the immediate emergency and the ears are never examined."

Science News Letter, June 15, 1935

●RADIO

Tuesday, June 18, 3:30 p. m., E.S.T.

EARTH'S TREASURE HOUSES OF THE METALS, by Dr. Edson S. Bastin, Professor of Geology, University of Chicago, and Chairman of the Division of Geology and Geography of the National Research Council.

Tuesday, June 25, 3:30 p. m., E.S.T.

POISON IVY, By Dr. James F. Couch, Bureau of Animal Industry, U. S. Department of Agriculture.

In the Science Service series of radio addresses given by eminent scientists over the Columbia Broadcasting System.

ETHNOLOGY

Head Hunters In Borneo Now Disappearing Race

ONE of the famous former head-hunting races of North Borneo is being exterminated by malaria. This is suggested by Dr. A. J. Copeland, late Government District Surgeon in British North Borneo. (*Lancet*, May 25)

The endangered people are known as the Muruts. The other principal head-hunting race of North Borneo—the Dusuns—does not seem to suffer from an increase of malaria; their population is, indeed, on the increase. The Dusuns are agricultural people, growing rice on the higher, open lands. Muruts inhabit the jungles at lower levels and live mainly by hunting.

The Murut population is reported to have been falling steadily for the past eight years.

In Dr. Copeland's opinion the Muruts' remarkable change from a flourishing race to a disappearing one, is due primarily to ravages of malaria and only secondarily to the wide variety of fatal diseases which finish the process malaria has begun.

He believes that increase of the malaria is due to two new causes, acting on one old one.

The new factors are firstly the arrival, starting about 1925, of Javanese laborers, 65 per cent. of whom are infected with a serious type of malaria, and secondly the indiscriminate clearing of the jungle. The old factor is the habit of the Muruts—but not of the Dusuns—of living in communal "long-houses," each of which accommodates an entire village and is supported on wooden posts that afford most desirable resting-places for anopheles mosquitoes.

These races have always been subject to malaria. But to the strain of the disease normally endemic in their region they have acquired a considerable degree of immunity. This does not protect them from the strains imported by Javanese laborers.

Science News Letter, June 15, 1935

TECHNOLOGY

Wood Waxed to Center By Forest Service Process

WAXING wood to its very center instead of merely on the surface is accomplished by a new process worked out at the U. S. Forest Service laboratories, Madison, Wis., by Dr. A. J. Stamm.

The wood is "embalmed," as Dr. Stamm terms it, by first giving the wood a preliminary chemical treatment that makes it permeable to the melted wax. Beeswax and stearin are among the waxes thus far successfully used. It is stated that rosin, linseed oil and other substances that will mix with wax can also be employed.

Wood thus processed is waterproof and resists warping, shrinking, checking and cracking. Permanently waxed floors and furniture are among the promising possibilities suggested.

Science News Letter, June 15, 1935

MEDICINE

Mystery of Fatal Blood Disease Now Nears Solution

THE MYSTERY of agranulocytosis, new and fatal disease of too few white cells in the blood, seems nearer solution as a result of studies reported by Drs. Francis P. Parker and Roy R. Kracke of Emory University, Ga., to the American Society of Clinical Pathologists.

The disease is apparently caused by certain popular headache remedies and pain-relieving drugs which contain a chemical group known as the benzene ring, investigators have found. That discovery, however, did not entirely solve the mystery of the disease because so many persons use these drugs in large quantities while comparatively few develop the disease.

Benzene's effect of reducing the number of white blood cells may take place by reducing the amount of a sulfur-containing substance found in blood and bone marrow, the studies now reported indicate. This substance is glutathione and it is thought to be responsible for speeding up cell division in the bone marrow where blood cells are formed.

Examination of the bone marrow in cases of granulopenia showed that the rate of cell division was slowed up. Consequently Drs. Parker and Kracke believe the relation between the benzene and the glutathione is at the basis of the disease.

It is not yet possible to say whether the benzene reduces the glutathione and thus slows up cell division and consequent production of new white blood cells, or whether it works the other way around and persons with less glutathione develop the disease when they start taking the benzene-containing drugs.

The changes in glutathione content of the blood of patients suffering from various blood diseases was studied. The results suggest that depletion of the reduced form of glutathione in the bone marrow or blood stream may lead to reduction of white cells in the blood.

Liver extracts, which are used to treat conditions of too few white cells, like agranulocytosis, contain a large amount of reduced glutathione, which may mean that it is this substance that is responsible for the improvement obtained with liver treatment of these diseases. Another substance used to treat these conditions, pentnucleotide, contained only a trace of the reduced glutathione.

The disease is twice as common among women as men. First observed in 1922, it seems to have been on the increase in recent years. It caused thirteen hundred deaths in the United States during the three years 1931-1934. It starts suddenly with fever and sore throat and usually ends fatally in spite of vigorous treatment.

Science News Letter, June 15, 1935

GENETICS

Epilepsy In Mice May Give Light On Human Disease

INHERITANCE of some forms of epilepsy in humans may be explained as a result of the discovery of hereditary epilepsy in a species of American mouse, it is suggested by Dr. Lee R. Dice of the Museum of Zoology at the University of Michigan.

Dr. Dice has just reported his discovery that epilepsy is a hereditary trait in the species of mouse known as *Peromyscus maniculatus artemisieae* and found in Franklin County, Washington.

A typical epileptic fit occurs in this mouse when it is subjected to sudden or disagreeable sounds or a change in surroundings. Sometimes the fit is severe enough to kill the mouse. The mouse is probably born with some faulty development of the nervous system which makes it impossible for the animal to adjust to unusual conditions which would not affect ordinary mice, Dr. Dice explains.

Further study of the disease in these mice will, Dr. Dice hopes, shed light on the inheritance of some forms of human epilepsy.

Science News Letter, June 15, 1935

AERONAUTICS

Balloon to be "Surveyed" To Check Its Altitude

THE NATION'S system of topographical surveys, criss-crossing the country like an invisible giant fish net, will help check the altitude of the Explorer II, giant stratosphere balloon of the National Geographic Society-U. S. Army Air Corps when it takes the air.

In unprecedented degree the altitude of the flight will be accurately checked from a multitude of ground stations along the path of the aerial trip by a corps of volunteer surveyors who will take up stations at the Federal "bench marks." These bench marks are bronze markers spaced 30 miles apart throughout the Plains region. They are the key points in the nation's system of topographical survey. The exact positions of the markers are known with great accuracy and from them the surveyors, with transit telescope, will be able to make measurements on the altitude of the balloon every fifteen minutes while it is in view.

Equipped with automobiles having radios, special code signals will be broadcast every fifteen minutes, at which time all the surveyors in sight of the balloon will take readings on its stratospheric positions. By trigonometry these readings can be translated into elevation above the surface of the earth. These observed altitudes can be checked with the sealed barographs aboard the Explorer II and thus check the accuracy of these instruments at high altitudes.

A third check on altitude at every instant will be the great aerial camera taking photographs of the ground below the balloon at frequent intervals.

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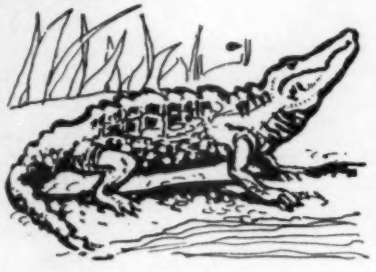
ZOOLOGY

NATURE RAMBLINGS
by Frank Thone



Debunking Man-Eaters

MAN-EATING sharks there may be: man-eating alligators there are not. "I have never known of but one authentic instance of an alligator wilfully attacking a human being unprovoked," declared E. A. McIlhenny, Louisianian who has lived among the big reptiles all his life and now has written a book about them. (*SNL, June* 1, *p.* 358.)

Mr. McIlhenny makes one qualification: females guarding the hidden nests where their eggs are laid.

"Female alligators will attack man to protect their nests and young, but their movements on land are so slow that there is no trouble in avoiding them, and in the water they always give warning if they are about to attack, by hissing and guttural grunts.

"It is a wonder more men are not injured by these powerful reptiles, for those who make a business of hunting them for their skins are most careless in handling them; but it is a rare thing for any one to be hurt by an alligator."

But what of the many reports of alligator attacks ending in severe injury to human beings? Fish stories, literally, says Mr. McIlhenny. There is a big, vicious, long-jawed, sharp-toothed fish in the Southern lakes and bayous, known as the alligator gar. It has all the strength and truculence of the muskellunge of the North or the barracuda of the warmer salt waters. Several cases of injury and drowning alleged against alligators have been investigated by Mr. McIlhenny, and an alligator gar turned up as the culprit in each one.

Tall tales of terror about 'gators would appear to be of quite recent origin, at least in the author's neighborhood, for he says, "In my boyhood days, before these reptiles had been disturbed by hide-hunters, I came in contact with them constantly, and seeing them was such an everyday occurrence that no unusual notice was taken of them by the children playing and swimming in the streams. They were looked upon as part of our natural surroundings, and we paid no more attention to them than we did to the flocks of birds about the place."

When he and his childhood companions were in swimming, they entertained themselves by "calling" 'gators to surround them. "We would attract them by imitating the barks and cries of dogs and by making loud popping noises with our lips . . . We had no fear of them and would swim around the big fellows, dive under them and sometimes treat them with great disrespect by bringing handfuls of mud from the bottom and 'chunking' it in their eyes."

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PSYCHOLOGY

Five Minutes is Limit To Enjoyment of Painting

THE enthusiast who claims that she "could stand for hours before that painting" is really enjoying herself and not the artistic creation, Prof. Frank J. Mather, director of the Museum of Historic Art at Princeton University, concludes after examining the "varying tensions and durations of esthetic experience from the several arts."

Enjoyment of a painting or of a statue ceases after five minutes of inspection, he declares. Theatrical performances and the opera, aided by intermissions, can hold the attention for two and a half hours; architecture for half an hour; music for a half hour at a stretch, or for three hours with intermissions; and literature for an indeterminate period.

The arts most keenly enjoyed for the longest periods of time are those closest to what he terms "the rhythms of ordinary living," Prof. Mather theorizes.

"Literary arts deal in rhythms wholly familiar to us," he explained. "These rhythms arise in our most intimate feeling and thinking, they are shaped by our whole physiology, are measured by the ingoing and outgoing of our breath, by the beat of our pulse, by the resistance or conductivity of our nerves.

"Poetry or impassioned prose," Prof. Mather declares, "moves us more readily, more deeply, and for a longer space of unflagging enjoyment than any of the other arts."

Defending his assertion that the limit of enjoyment of painting or sculpture is five minutes, he denies the validity of statements made by persons who claim to be entranced by them for longer periods. They have doubtless enjoyed something, presumably themselves, before a painting or statue in a pleasurably bemused condition, but enjoying one's own confused reverie even while slackly looking at a work of art is something far different from enjoying the work of art itself.

"The very brevity of the enjoyment of painting and sculpture," Prof. Mather holds, "means that we can pack into an hour in any good art museum more variety and intensity of esthetic experience than we can gain from many hours spent with any other art."

Prof. Mather's observations, originally put forth in lectures delivered on the Louis Clark Vanuxen Foundation this winter, are now in book form entitled "Concerning Beauty," published by the Princeton University Press.

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PHYSIOLOGY

Chemistry Of Digestion Goes On Without Stomach

FOOD when eaten frequently in small amounts can be digested even when the stomach has been removed, as is sometimes necessary in cancer of the stomach, it appears from studies reported by Dr. Edward S. Emery, Jr., of Boston.

Dr. Emery was investigating the problem of decreased digestion which follows removal of the stomach. The latter is of course responsible for only part of the digestive process. Dr. Emery's studies showed that decreased digestion after its removal is not due to disturbance of the chemistry of digestion, because of lack of stomach juices. Instead it is due to disturbance of the mechanics of the digestive tract, he said. This can apparently be overcome by feeding small amounts at frequent intervals. His studies were made on dogs.

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•First Glances at New Books

Physics

RELATIVITY, GRAVITATION AND WORLD-STRUCTURE — E. A. Milne — *Oxford*, 365 p., $8.50. Prof. Milne is one of the world's best known mathematicians who does not believe, like so many of his colleagues, that it is ever impossible to gain insight into seemingly abstract mathematical concepts. Such a situation may be so, Prof. Milne admits, but it never can be established. Hearing a distinguished colleague state that "we do not know, and probably shall never know, why space is expanding" Prof. Milne felt this statement was carrying scientific pessimism too far and was stimulated to attempt an understanding of this fascinating subject for himself. The result is the present book where one can follow Prof. Milne from his elementary common sense viewpoint, at the start, to highly technical discussions later on. It is possible to see how it came about that the universe is expanding and why the relative velocities of the various objects are proportional to their mutual distances. Not written for popular "best-seller" consumption like the works of Jeans and Eddington, Prof. Milne's book will be welcomed by all those who have had graduate training in physics and mathematics.

Science News Letter, June 15, 1935

Medicine

WHAT YOU SHOULD KNOW ABOUT HEART DISEASE—H. E. B. Pardee—*Lea and Febiger*, 127 p., $1.50. This simply written authoritative book should be of great help to the person who has heart disease by supplementing the advice and explanations his physician has given him. Its usefulness, however, is not limited to sufferers from heart disease. Any interested lay reader will find in this volume an adequate explanation of how the heart works and the blood circulates, what things disturb these functions, the early symptoms of heart disease, and similar valuable information.

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Chemistry

THE FUNDAMENTALS OF GENERAL CHEMISTRY — P. A. Bond — *Farrar & Rinehart*, 421 p., $3. An elementary chemical textbook which strikes out from the time-worn beaten path. The traditional chemistry begins by a description of the various elements and brings in the underlying chemical laws later. Prof. Bond does just the opposite in his book. The fundamental laws of the conservation of energy and mass come where they should be; right at the start of the book. A touch of atomic theory is followed by kinetic theory and then one is ready to go ahead with chemistry. The book is chemistry with a physical approach and more in keeping with the thinking methods of advanced chemistry than previous more orthodox books in its field.

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Physiography

THE POLAR REGIONS—Ed. by J. M. Scott—*Oxford University Press*, 100 p., $2. An even hundred beautiful photographs of the Arctic and Antarctic regions. They give new concepts of the flora and fauna of the polar regions and show what man must meet when he ventures there. Some of the pictures are historically priceless, as, for example, the scene photographed by Robert Scott's South Pole expedition at the South Pole itself where they found the camp made by Amundsen but a short time earlier.

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Miscellaneous

ADVENTURES IN AMERICANA—Frederick Woodward Skiff—*Metropolitan Press*, 366 p., $2.50. A veteran collector tells some of the exciting and amusing experiences that have occurred in his 40 years of antique-hunting. While he has pursued such game as old china, furniture, pewter, and paintings, Mr. Skiff reserves his greatest enthusiasm for first editions of American authors. Many notes on pioneer life in the West are interesting by-products of his collecting adventures in Oregon.

Science News Letter, June 15, 1935

Photography

MAKING A PHOTOGRAPH — Ansel Adams — *Studio Publications*, 96 p., XXXII plates, $3.50. An introduction to the art of making good photographs which starts from the planning of a darkroom and goes to the finer shades of meaning in composition of pictures. Beautifully illustrated with the author's own photographs.

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Anthropology

THE EMPIRE OF THE SNAKES—F. G. Carnochan and H. C. Adamson—*Stokes*, 290 p., $2.50. The search for African snakes for the Washington zoo led Dr. Carnochan into the adventures described in this entertaining book. In Tanganyika he not only "found the Snake-People and became a friend of their Emperor, but was also enrolled in their ranks and taught their secret medicine." Medicines used by these Africans in treating ills, particularly the bite of deadly snakes, were obtained in sample portions for analysis, and further investigation is believed warranted. The collaborator, Mr. Adamson, to whom Dr. Carnochan told his exciting experiences, is assistant to the president of the American Museum of Natural History.

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Astronomy

AN INTRODUCTION TO ASTRONOMY —Robert H. Baker—*Van Nostrand*, 312 p., $3. Prof. Miller here adapts the text of a larger work, without sacrificing essentials, for use in shorter introductory courses.

Science News Letter, June 15, 1935

Physics

MECHANICS AND APPLIED HEAT WITH ELECTROTECHNICS — S. H. Moorfield and H. H. Winstanley — *Longmans, Green*, 403 p., $2.25. A British textbook for first-year engineering students.

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Anthropology

THE RACES OF MAN, DIFFERENTIATION AND DISPERSAL OF MAN—Robert Bennett Bean—*University Society*, 134 p., $1 cloth, 60c paper. A new edition of a handbook which, being written by an anatomist, stresses interesting facts about racial differences from an anatomist's viewpoint. Sixty-nine illustrations and a number of charts and tables are provided.

Science News Letter, June 15, 1935

Aeronautics

PIONEER WIND TUNNELS — N. H. Randers-Pehrson — *Smithsonian Institution*, 20 p., 4 pl., 20c.

Science News Letter, June 15, 1935